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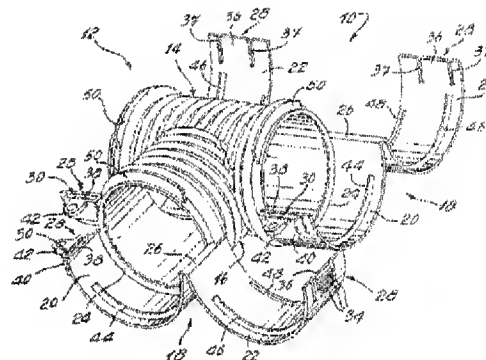
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(54) RACCORD DE TUYAUTERIE

(54) PIPE FITTING

(57)

A pipe fitting comprises a tubular body having an integral adjustable clamping end portion projecting axially from each end thereof. Each clamping end portion is adapted to be contracted radially inwardly to couple the pipe fitting to the pipe. A locking structure is provided on each clamping end portion for releasably retaining the same in its contracted state. The locking structure is adjustable to allow the pipe fitting to be readily coupled to pipes having different diameters.





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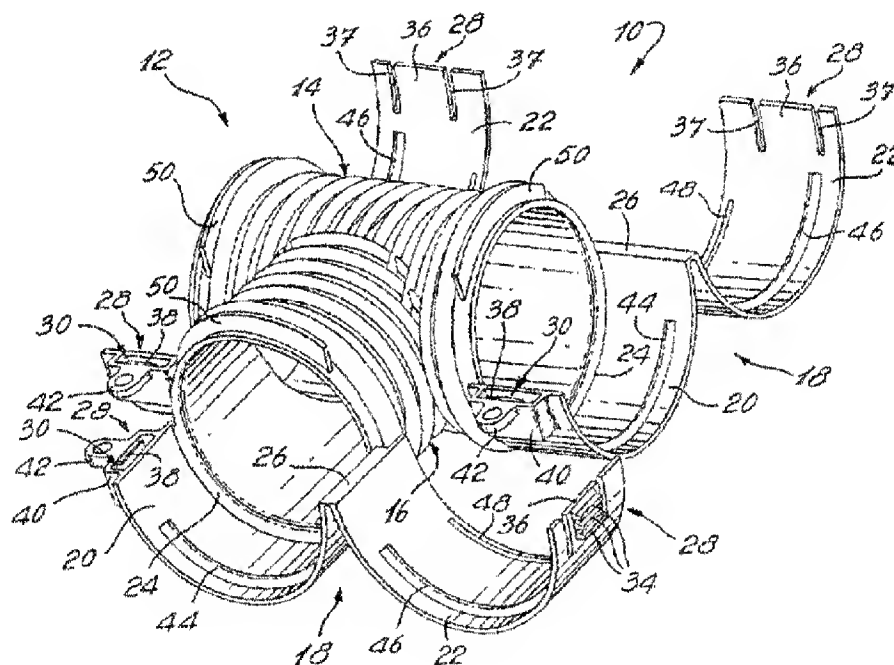
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(57) Abrégé/Abstract:

A pipe fitting comprises a tubular body having an integral adjustable clamping end portion projecting axially from each end thereof. Each clamping end portion is adapted to be contracted radially inwardly to couple the pipe fitting to the pipe. A locking structure is provided on each clamping end portion for releasably retaining the same in its contracted state. The locking structure is adjustable to allow the pipe fitting to be readily coupled to pipes having different diameters.

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ABSTRACT

PIPE FITTING

A pipe fitting comprises a tubular body having an integral adjustable clamping end portion projecting axially from each end thereof. Each clamping end portion is adapted to be contracted radially inwardly to couple the pipe fitting to the pipe. A locking structure is provided on each clamping end portion for releasably retaining the same in its contracted state. The locking structure is adjustable to allow the pipe fitting to be readily coupled to pipes having different diameters.

## PIPE FITTING

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

5       The present invention relates to pipes and, more particularly, to pipe fittings installation.

#### 2. Description of the Prior Art

10       Over the years various fittings have been developed to connect two or more corrugated pipes together.

15       For instance, it is already known to couple a fitting by passing a snap ring over the end of a corrugated tube and tightening a union nut. This type of fitting cannot be manually installed without a tool and involves separate fixation elements which contributes to increase the time required to couple the fitting to the corrugated pipe.

20       Accordingly, efforts have been made to develop a fitting which can be fitted more easily and more rapidly on a corrugated pipe. For instance, United States Patent No. 4,919,462 issued on April 24, 1990 to Matsui et al. discloses a connection fitting comprising a cylindrical body to which a bow-shaped locking element is hinged for pivotal movement about an axis parallel to a central axis of the cylindrical body. A pair of circumferentially extending openings are defined in the cylindrical body at a distance from one end thereof for respectively receiving first and second rib elements extending from the inner surface of the bow-shaped locking element. A hook is provided at the free distal end of the bow-shaped locking element to cooperate with a catch formed on the circumference of the cylindrical body for releasably retaining the bow-shaped locking element in a closed position with the ribs thereof engaged between corresponding pairs of corrugations of the pipe.

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Although, the fitting disclosed in the above mentioned patent is effective, it has been found that there is a need for a new pipe fitting which consist of a minimum of parts, and which is adjustable to fit pipes of different diameters while still offering ease of installation.

#### SUMMARY OF THE INVENTION

It is therefore an aim of the present invention to provide a new pipe fitting which offers ease of installation and removal.

It is also an aim of the present invention to provide a pipe fitting which can be used with a range of pipes of different diameters.

It is a further aim of the present invention to provide a pipe fitting which is relatively simple and economical to manufacture.

Therefore, in accordance with the present invention, there is provided a pipe joint assembly comprising a pipe having a leading end and an outer surface, and a pipe fitting including a tubular body. The pipe fitting further includes a least one integral clamping end portion projecting axially from one end of the tubular body thereof. The clamping end portion is displaceable in a generally circumferential direction between an open position and a selected one of at least two closed positions for selectively coupling the pipe fitting to the leading end of pipes having different cross-sections, and a locking structure provided on the clamping end portion for releasably retaining the same in the selected closed position thereof.

In accordance with a further general aspect of the present invention there is provided a unitary pipe fitting adapted to be coupled to a leading end of a pipe having an outer surface. The unitary pipe fitting comprises a tubular body having at least one integral clamping end portion adapted to be closed

inwardly against the outer surface of the pipe to couple the tubular body to the leading end of the pipe. The clamping end portion has first and second halves. The first half projects axially of the tubular body and is stationary with respect thereto. The second half is pivotally connected to the first half for pivotal movement between an open position for allowing the clamping end portion to be positioned on the leading end of the pipe and a selected one of a variety of closed positions for coupling the leading end of pipes having different cross-sections. The first and second halves are provided with complementary interlocking structures on respective free distal end portions thereof for releasably retaining the second half in a selected one of the closed positions thereof.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Having thus generally described the nature of the invention, reference will now be made to the accompanying drawings, showing by way of illustration a preferred embodiment thereof, and in which:

Fig. 1 is a top perspective view of a pipe fitting in accordance with a first embodiment of the present invention; and

Fig. 2 is a bottom perspective view of the pipe fitting of Fig. 1.

Fig. 3 is a cross-sectional view of one branch of the pipe fitting in the process of being clampingly engaged on a cylindrical corrugated pipe.

#### DESCRIPTION OF THE PREFERRED EMBODIMENTS

Now referring to the drawings, and in particular to Figs. 1 and 2, a pipe fitting embodying the elements of the present invention and generally designated by numeral 10 will be described.

According to the illustrated embodiment, the pipe fitting 10 is provided in the form of a T-joint 12 having three branches formed by a tubular

transversal portion 14 and a tubular stem portion 16 extending perpendicularly away from a central area of the transversal portion 14. The transversal portion 14 and the stem portion 16 are integrally connected to allow flow communication therebetween. According to the illustrated embodiment, the transversal portion 14 and the stem portions 16 are both provided in the form of continuous cylindrical corrugated tubes of substantially constant cross-section.

10 An integral clamping end portion 18 is provided at each free distal end of the transversal portion 14 and the stem portion 16 in order to facilitate the connection of the T-joint 12 with associated pipes P (see Fig. 3). The clamping end portions 18 are identical and are of unitary construction with the T-joint 12.

Each clamping end portion 18 includes first and second semi-cylindrical clamping members 20 and 22. The first clamping member 20 of each clamping end portion 18 projects axially away from the associated free terminal end of the T-joint 12 and is immobile with respect thereto. More specifically, each first clamping member 20 is integrally connected along a rear arcuate edge 24 thereof to the associated free distal end of the T-joint 12.

The second clamping member 22 of each clamping end portion 18 is pivotally connected to the associated first clamping member 20 for pivotal movement about an axis parallel to the central axis of the corresponding branch of the T-joint 12. More particularly, the first and second clamping members 20 and 22 of each clamping end portion 18 are pivotally interconnected at a common rectilinear edge thereof via a live hinge 26. The second clamping member 22 of each clamping end portion 18 is pivotable between an open position, as seen in Figs. 1 and 2, in which the second clamping member 22

extends laterally of the associated first clamping member 20 and a closed position wherein said second clamping member 22 is diametrically opposed to the first clamping member 20 so as to tightly encircle a pipe P.

An adjustable locking structure 28 is molded integrally with each clamping end portion 18 to releasably retain the same in one of a selected closed positions thereof. The locking structure 28 includes first and second cooperating locking members 30 and 32 respectively provided at respective free distal ends of the first and second clamping members 20 and 22 opposite the common rectilinear edge thereof.

The second locking member 32 of each locking structure 28 includes a series of ratchet teeth or serrations 34 provided on a central flexible tongue 36 formed at the free distal end of each second clamping member 22 by a pair of parallel circumferentially extending cuts 37. According to the illustrated embodiment, three serrations 34 are formed on each tongue 36. The first locking member 30 of each locking structure 28 includes a lug 38 which is adapted to snap in engagement with a selected one of the serrations 34 of the associated second locking member 32. Each lug 38 projects inwardly of a C-shaped structure 40 extending integrally radially outwardly from the free distal end of each first clamping member 20. Each C-shaped structure 40 defines a catch for receiving the associated tongue 36 therein with the sides of the C-shaped structure engaged in the cuts 37 forming the tongue 36. This arrangement advantageously contributes to increase the structural rigidity of each clamping end portion 18 while at the same time preventing disengagement of the lug 38 from the serrations 34 in a direction transversal to the tongue 36.



By selectively engaging the tongue 36 with the first, second or third serrations 34, it is possible to retain the associated second clamping member 22 of each clamping end portion 18 in three  
5 different closed positions, thereby allowing each clamping end portion 18 to tightly encircle pipes of three different external diameters.

A tab 42 extends integrally outwardly from each C-shaped structure 40 to allow the associated  
10 lug 38 to be pulled out of engagement from the mating serrations 34 in order to unlock the clamping end portion 18. Accordingly, the force to release each locking structure 28 must be exerted in the plane of the lug 38 thereof, as indicated by arrow 43 in Fig.  
15 3. This is particularly important in applications where the fitting 10 is buried in the soil in that it prevents the locking structure 40 from being released under the weight of the backfill material.

First and second inner ribs 44 and 46  
20 respectively extend along a portion of the inner circumference of the first and second clamping members 20 and 22 of each clamping end portion 18. When the second clamping member 22 of one of the clamping end portions 18 is pivoted to a closed  
25 position thereof, the associated second rib 46 will be diametrically opposed to the first rib 44 of the associated first clamping member 20 for engagement between two successive corrugations C of the corrugated pipe P to be connected to the fitting 10.  
30 This will contribute to prevent axial removal of the pipe P from the fitting 10. The fact that the first and second inner ribs 44 and 46 extend only along a portion of the first and second clamping members 20 and 22 allows each clamping end portion 18 to  
35 preserves its adjustability.

A circumferentially extending slot 48 is defined in a portion of the circumference of each

second clamping member 22 for receiving a complementary rib 50 extending radially outwardly from a portion of the associated terminal end of the T-joint 12. Each rib 50 is disposed to be engaged within the slot 48 of the associated second clamping member 22 when the same is pivoted to one of its closed position thereof. This advantageously ensures increased structural rigidity of the clamping end portions 18.

The T-joint 12 is preferably molded in one piece from a plastic material, such as polyethylene.

In use, a selected clamping end portion 18 of the T-joint 12 is first engaged on the leading end of a corrugated pipe P with the selected clamping end portion 18 assuming an open or at least partly open position thereof. Then, the second clamping member 22 of the selected clamping end portion 18 is pivoted to a closed position until the first and second clamping members 20 and 22 tightly encircle the pipe P with the first and second inner ribs engaged between a corresponding pair of corrugations C of the corrugated pipe P. The pivot of the second clamping member 22 automatically causes the lug 38 to snap in place against one of the serrations 34, thereby retaining the second clamping member 22 in the desired closed position thereof. The T-joint 12 is retained on the pipe P due to the frictional forces resulting from the contraction of the selected clamping end portion 18 on the outer surface of the pipe P and the engagement of the first and second inner ribs 44 and 46 with the corrugations C of the pipe P.

To remove the pipe P from the T-joint 12, one has simply to pull on the tab 42 of the locking structure 28 of the selected clamping end portion 18 so as to disengage the lug 38 from the serrations 34

and then pivot the second clamping member 22 away from the first clamping member 20.

The above described T-joint 12 is advantageous in that it offer ease of installation.  
5 Furthermore, it is adjustable to fit pipes having different diameters.

CLAIMS:

1. A pipe joint assembly comprising a pipe having a leading end and an outer surface, and a pipe fitting including a tubular body, at least one integral clamping end portion projecting axially from one end of said tubular body, said clamping end portion being displaceable in a generally circumferential direction between an open position and a selected one of at least two closed positions for selectively coupling said pipe fitting to the leading end of pipes having different cross-sections, and a locking structure provided on said clamping end portion for releasably retaining the same in said selected closed position thereof.

2. A pipe joint assembly as defined in claim 1, wherein said clamping end portion is provided with first and second pivotally interconnected clamping members, and wherein said locking structure includes complementary locking members provided on respective free distal end portions of said first and second clamping members.

3. A pipe joint assembly as defined in claim 2, wherein said second clamping member is mounted for pivotal movement relative to said second clamping member and said tubular body about a pivot axis parallel to a central axis of said tubular body.

4. A pipe joint assembly as defined in claim 3, wherein said first clamping member is stationary relative to said tubular body, said first clamping member and said tubular body being of unitary construction.

5. A pipe joint assembly as defined in claim 4, wherein said first and second clamping members are formed as semi-cylindrical members pivotally interconnected along respective proximal linear edges opposite said free distal end portions thereof, said semi-cylindrical members being in generally diametrical opposed relationship in said closed position thereof.

6. A pipe joint assembly as defined in claim 5, wherein said first and second clamping members are pivotally connected to each other via a live hinge.

7. A pipe joint assembly as defined in claim 6, wherein said first clamping member is integrally connected along a rear arcuate edge thereof to said tubular body.

8. A pipe joint assembly as defined in claim 2, wherein said second clamping member is provided with a first retaining member adapted to engage a second cooperating retaining member provided on said tubular body in order to directly structurally connect said second clamping member to said tubular body when said second clamping member is displaced to said closed position thereof.

9. A pipe joint assembly as defined in claim 8, wherein said first retaining member includes an elongated transversal slot defined in said second clamping member, and wherein said second retaining member includes an elongated transversal ridge projecting outwardly from said tubular body for engagement within said elongated transversal slot when said second clamping member is displaced to said closed position thereof.

10. A pipe joint assembly as defined in claim 2, wherein at least one of said first and second clamping members is provided with an inner transversally extending ridge for engagement between a pair of adjacent corrugations formed on the pipe.

11. A pipe joint assembly as defined in claim 2, wherein said complementary locking members are adjustably interlockable to allow said clamping end portion to fit around different sizes of pipes.

12. A pipe joint assembly as defined in claim 11, wherein said complementary locking members include a series of ratchet teeth and a lug releasably engageable therewith, said lug extending in a plane and being at least partly flexible to allow said lug to be manually disengaged from said series of ratchet teeth by pulling on said lug generally in said plane thereof.

13. A unitary pipe fitting adapted to be coupled to a leading end of a corrugated pipe having an outer surface, said unitary pipe fitting comprising a tubular body having at least one integral clamping end portion adapted to be closed inwardly against the outer surface of the pipe to couple said tubular body to the leading end of the pipe, said clamping end portion having first and second halves, said first half projecting axially of said tubular body and being stationary with respect thereto, said second half being pivotally connected to said first half for pivotal movement between an open position for allowing said clamping end portion to be positioned on the leading end of the pipe and a selected one of a variety of closed positions for coupling said unitary pipe fitting to the leading end of pipes having different cross-sections, said first

and second halves being provided with complementary interlocking structures on respective free distal end portions thereof for releasably retaining said second half in a selected one of said closed positions thereof.

14. A unitary pipe fitting as defined in claim 13, wherein said second half is pivotable relative to said first half and said tubular body about a pivot axis parallel to a central axis of said tubular body.

15. A unitary pipe fitting as defined in claim 14, wherein said first and second halves are pivotally interconnected to each other along adjoining proximal edges opposite said free distal end portion thereof via a live hinge.

16. A unitary pipe fitting as defined in claim 15, wherein said first and second halves have a semi-cylindrical shape.

17. A unitary pipe fitting as defined in claim 13, wherein said second half is provided with a first retaining member adapted to engage a second cooperating retaining member provided on said tubular body in order to directly structurally connect said second half to said tubular body when said second half is displaced to said closed position thereof.

18. A unitary pipe fitting as defined in claim 17, wherein said first retaining member includes an elongated transversal slot defined in said second half, and wherein said second retaining member includes an elongated transversal ridge projecting outwardly from said tubular body for engagement within said elongated transversal slot when said

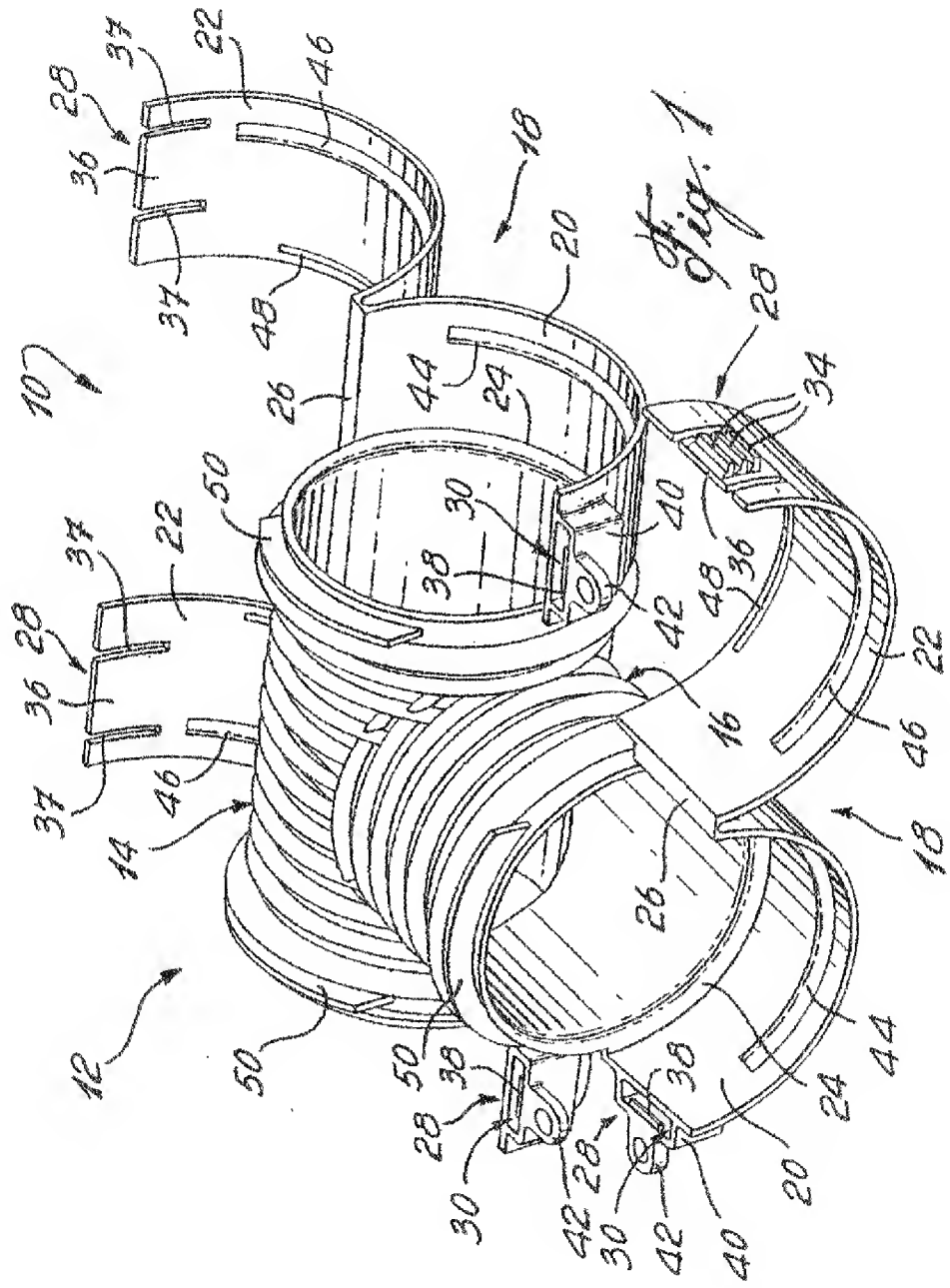
second half is displaced to said closed position thereof.

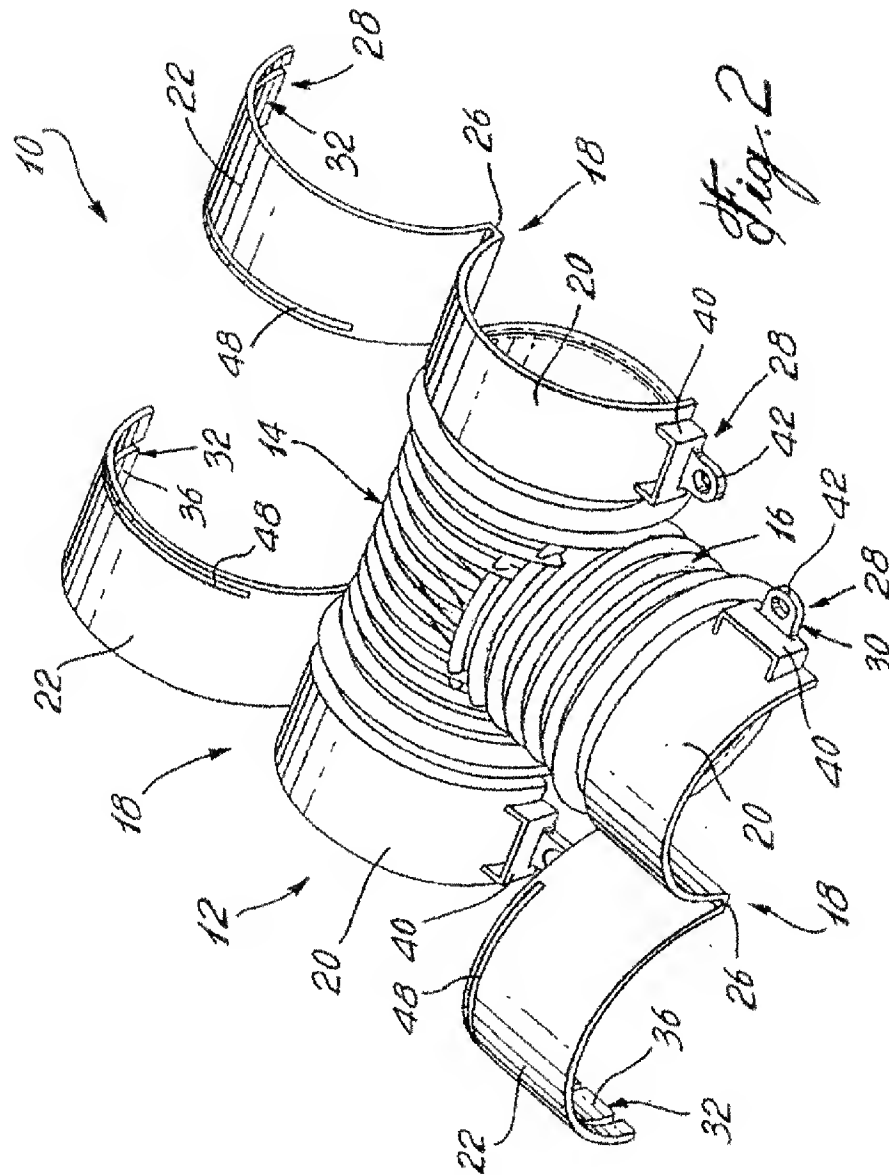
19. A unitary pipe fitting as defined in claim 13, wherein said complementary locking structures are adjustably interlockable to allow said clamping end portion to fit about pipes having different cross-sections.

20. A unitary pipe fitting as defined in claim 19, wherein said complementary locking structures include a series of ratchet teeth and a lug releasably engageable therewith, said lug extending in a plane and being at least partly flexible to allow said lug to be manually disengaged from said series of ratchet teeth by pulling on said lug in said plane thereof.

21. A unitary pipe fitting as defined in claim 13, wherein said second half is provided with an inner circumferentially extending ridge for engagement between a pair of adjacent corrugations of the corrugated pipe.







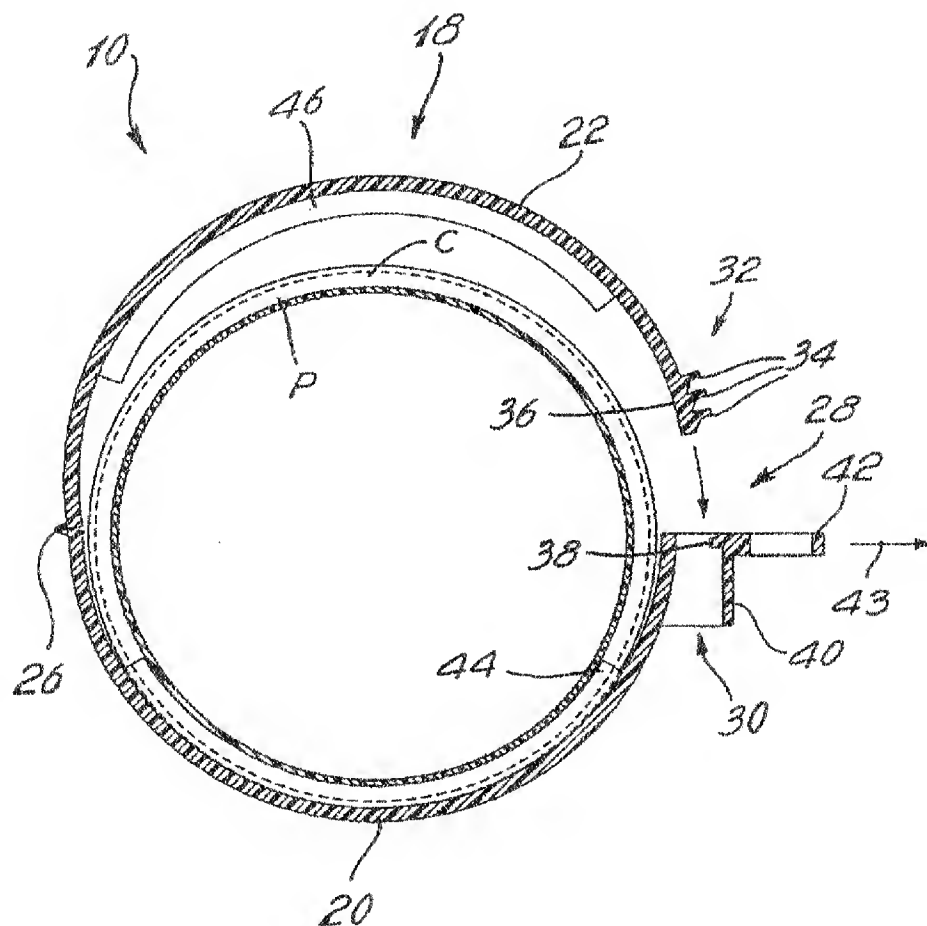


Fig. 3